PHILIPS

Philips Medical Systems

Replacement Kit Rotor Control HS

9890 000 0268x

Level 0 Documentation

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Printed in Hamburg, Germany

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SERVICE MANUAL – UNIT

Replacement Kit Rotor Control HS OPTIMUS

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File: Repl_kit_roco_hs_00601AB.doc

List of pages and drawings (LOPAD)

Manual Order No: 4512 988 00601
released: 12/2006

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1. INTRODUCTION AND TECHNICAL DATA

1.1. PURPOSE OF MANUAL

This document describes the detailed replacement procedure for the rotor control unit.
Additional stator inductance measurements are described to detect stator inductance problems which can lead to rotor control failures.

1.2. ITEMS SUPPLIED

9890 000 0268x Rotor Control HS

4512 988 00601 This manual

1.3. COMPATIBILITY

All OPTIMUS RAD/RF & C generators in combination with high-speed rotor control unit.

Rotor control HS	9890 000 0268x	4512 104 7360x / 7361x
Rotor control HS	9890 000 02212	4512 104 7140x
OPTIMUS RAD	9890 000 02001	release ≤ 2.x
OPTIMUS RAD/RF	9890 000 02001	release ≥ 3.x
OPTIMUS C	9890 000 0219x	release ≥ 1.x

1.4. TECHNICAL DATA

1.4.1. Tools

Tools

TC129 : Tool kit, standard 4522 980 38262
Inductivity measuring device to be obtained locally
or order at SL Hamburg (4512 101 77141)
Service PC with AGenT version 2.1.2

1.5. SAFETY INFORMATION

The general legal and factory safety recommendations for this X-ray equipment and the following recommendations must be strictly observed!

Start of installation, operation and maintenance work and especially electrical work must only be executed by trained and authorized persons. This equipment must only be serviced by properly educated service specialists who have received general and system-specific training as performed by Philips Medical Systems.

WARNING

The system/component must be switched OFF during replacement work.
Any X-ray unit produces ionizing radiation which may be harmful if not properly controlled. Therefore, it is recommended that this equipment be operated in accordance with the guidelines set down by the national council on radiation protection.

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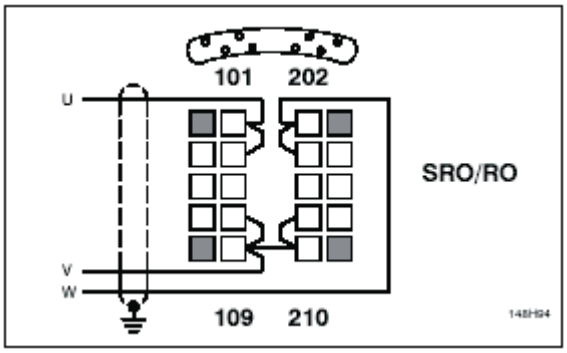
2. STATOR INDUCTANCE TEST

This test is suitable to detect internal stator coil short-circuits.

Depending on the location of a possible short-circuit (number of shorted wires), the resistance of the coil still shows a value within tolerance but the inductivity is out of tolerance. This leads to an increased stator current and can destroy the rotor control unit.

					SRO stator (mH)		
stator link			wire		-10%		+10%
U - V	**101/103 – 107/109**	=	**1 – 2**	≈	51.7	57	62.7
V - W	**208/210 – 202/204**	=	**2 – 3**	≈	30.6	34	37.4



- Stator links not removed.
- Stator wires U-V-W disconnected.

This check can be performed with a low-cost inductance measuring device obtainable locally or can be ordered at the
SLI Hamburg with the 12NC 4512 101 77141.

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3. PREPARATORY WORK

Due to the change of the cooling airflow for the rotor control unit in different generator types it is necessary to check in which type of generator the unit is to be replaced.

In case of :
OPTIMUS RAD/RF rel. ≥ 3.x generator serial number ≥ 970218
or
OPTIMUS C generator serial number ≥ 986001
no preparatory work is required.

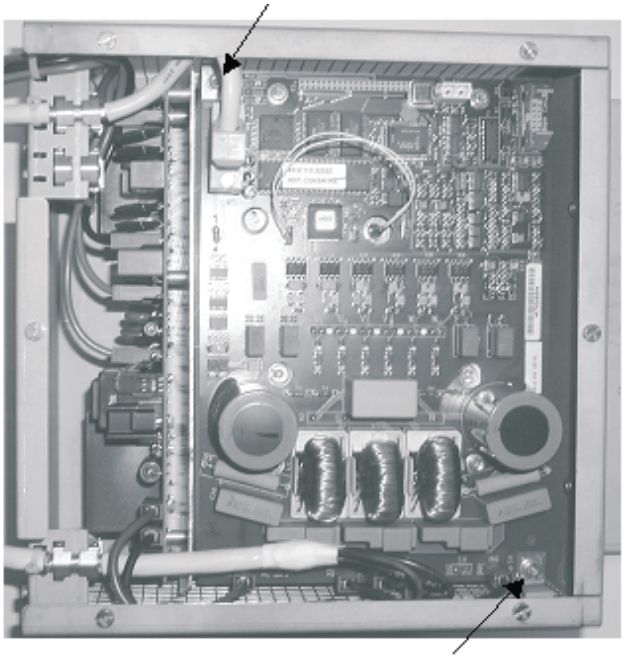
Follow immediately the replacement procedure
4.1 Replacement procedure for OPTIMUS RAD/RF rel.3.x OPTIMUS C on page 9.

If the generator serial number is ≤ 970217 the fan in the rotor control unit must be turned over to correct the cooling airflow direction before the unit is replaced.

3.1. FAN AIRFLOW DIRECTION CORRECTION

- Open the cover.
  Turn the screws 1..2 turns counter clockwise to loosen the screws and remove the cover plate.

- Remove the two ground connection screws.



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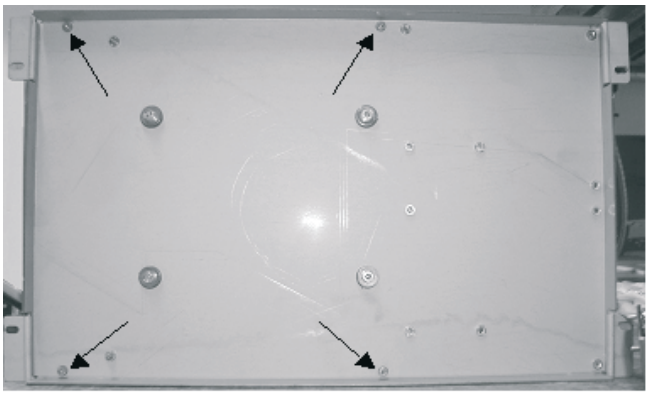
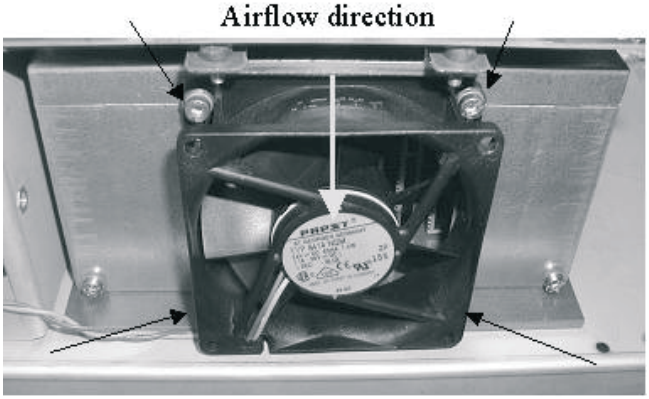
- Remove the four fixing screws for the side panel.

- Turn the unit top side down and remove the four screws.
- Turn the unit carefully back and remove the I_I shaped side panel.

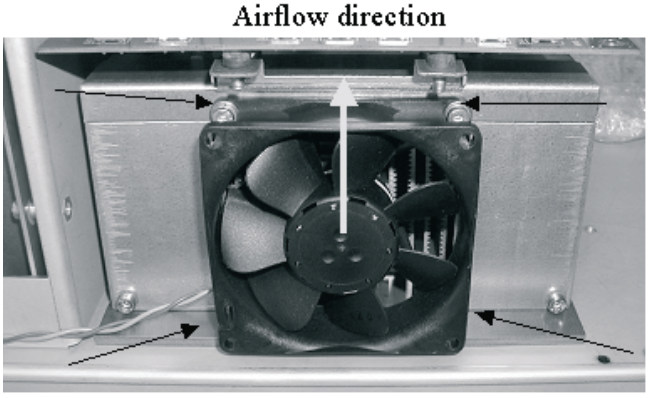


- Remove the four fixing screws of the fan and turn the fan through 180° to change the airflow direction.

Initial delivery, airflow direction for Optimus rel. 3 and Optimus C generators.



Turned fan, airflow direction for Optimus rel. 2 generators.



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4. REPLACEMENTS

4.1. REPLACEMENT PROCEDURE FOR OPTIMUS RAD/RF REL.3.X / OPTIMUS C

CAUTION

Switch the generator OFF and disconnect it completely from mains with the earth-leakage breaker or mains switch!

4.1.1. Removal of old rotor control (RoCo) unit

- Remove the data cable from back panel EZX 51 and leave it with the old RoCo unit.
- Disconnect the stator wires from terminal EX 1100 (single-tube generator).

In case tube switch unit EWG is present:

- Remove plug EY 100 X3, it will be used again later.
- Disconnect stator cable Y100 – EWG at EWG K11:1 :2 :3 and leave it with the old RoCo unit.
- Remove the mains wires from ENF3: T1 :T2 :T3 and ENX 1102 and leave them with the old RoCo unit.
- Remove the RoCo unit completely from the generator.

4.1.2. Installation of the new RoCo unit

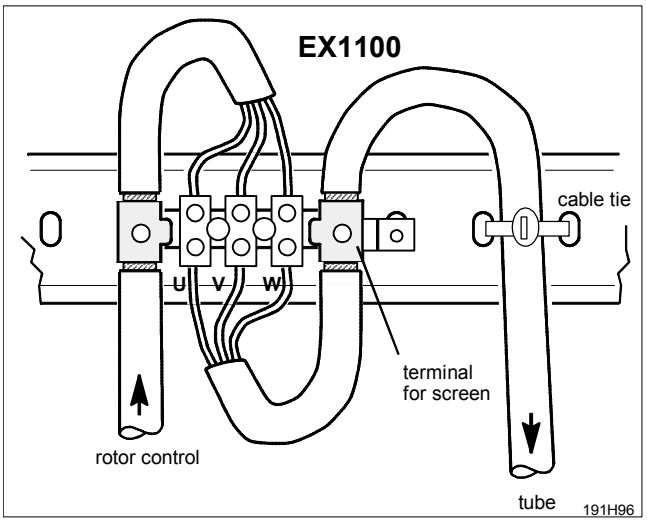
- Install the new unit in the generator.
- Connect the mains wires at ENF3: T1 :T2 :T3 and ground wire to ENX 1102.

In case tube switch unit EWG is present:

- Connect the stator cable of the RoCo unit at EWG K11: 1 :2 :3.
- Reconnect plug EY 100 X3.

Single tube generator:

- Connect the stator cable to terminal EX 1100 (U-V-W) and the cable of the RoCo unit likewise.
- Make sure the screen of the stator cable is properly connected to ground.
- Relieve the tension on the stator cable with a tie-wrap.



NOTE

Use screened cables. Connect the screen to earth at both ends. (0722 215 02054)
Do not mix up the phases, otherwise components of the rotor control may be destroyed.

- Connect the data cable at EZX51.
- Tighten all cables and wires with tie-wraps.

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- Switch the generator ON.
  If errors 10TD and 10TI appear the tube data have to be updated for the new RoCo unit HS.

  Download from InCenter X-ray Generator OPTIMUS RAD/RF other Downloads “Tube_r3tdl”.

  – **new file, 154224 byte and date is 20. 02. 04**.

- Connect the service PC to the generator and start AGenT.
- Load tube data for specific tube(s).
- Select RGDV without sync contact for tube adaptation.
  Systems with Bucky controller firmware rel 5.x (bDTH2, EasyD with bucky) and THORAVISION systems:
  Remove EZx42/43/23 from the back panel, wait 2 minutes to have access to the generator, set mounted radiographical controller to none, no sync contact.
  Perform tube adaptation for all tubes.

- Check that the start-up and brake function of the tube(s) work properly.
  In case rotation prolongation is programmed: Once started with PREP, the anode keeps rotating for 30 seconds. After the last let go of the PREP position as long as no exposure has been switched. The anode finally stops if an exposure has been switched or after 30 seconds or if any of the desk buttons has been activated.

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4.2. REPLACEMENT PROCEDURE FOR OPTIMUS RAD/RF REL.2.X

CAUTION

Switch the generator off and disconnect it completely from mains with the earth leakage breaker or the mains switch!

4.2.1. Removal of the old RoCo unit

- Remove the data cable from back panel EZX 51 and leave it with the old RoCo unit.
- Disconnect the stator wires from terminal EX 1100 (single-tube generator).

In case tube switch unit EWG is present:

- Remove plug EY 100 X3, it will be used again later
- Disconnect stator cable Y100 – EWG at EWG K11:1 :2 :3 and leave it with the old RoCo unit.
- Remove the mains wires from ENF3: T1 :T2 :T3 and ENX 1102 and leave them with the old RoCo unit.
- Remove the RoCo unit completely from the generator.

4.2.2. Installation of the new RoCo unit

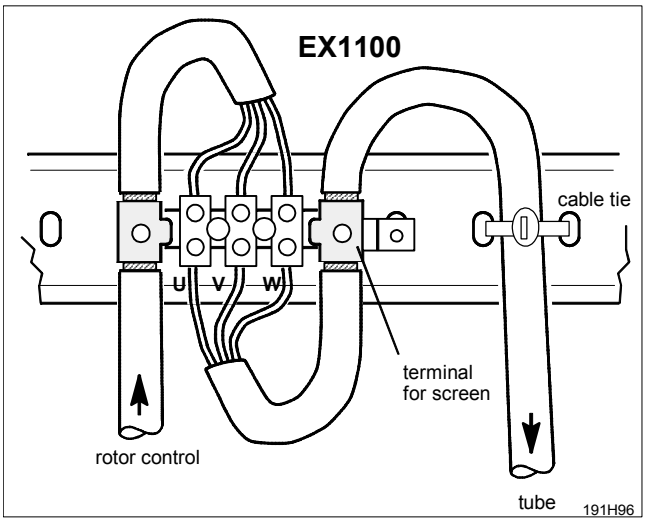
- Install the new unit in the generator.
- Connect the mains wires at ENF3: T1 :T2 :T3 and the ground wire to ENX 1102.

In case tube switch unit EWG is present:

- Connect the stator cable of RoCo unit at EWG K11: 1 :2 :3.
- Reconnect plug EY 100 X3.

Single tube generator:

- Connect the stator cable to the terminal EX 1100 (U-V-W) and the cable of the RoCo unit likewise.
- Make sure the screen of the stator cable is properly connected to ground.
- Relieve the tension on the stator cable with a tie-wrap.



NOTE

Use screened cables. Connect the screen to earth at both ends. (0722 215 02054)
Do not mix up the phases, otherwise components of the rotor control may be destroyed.

- Connect the data cable at EZX51.
- Tighten all cable and wires with tie-wraps.
- Check that the start up and brake function of the tube(s) work properly.
  In case rotation prolongation is programmed: Once started with PREP, the anode keeps rotating for 30 seconds. After the last let go of the PREP position as long as no exposure has been switched. The anode finally stops if an exposure has been switched or after 30 seconds or if any of the desk buttons has been activated.

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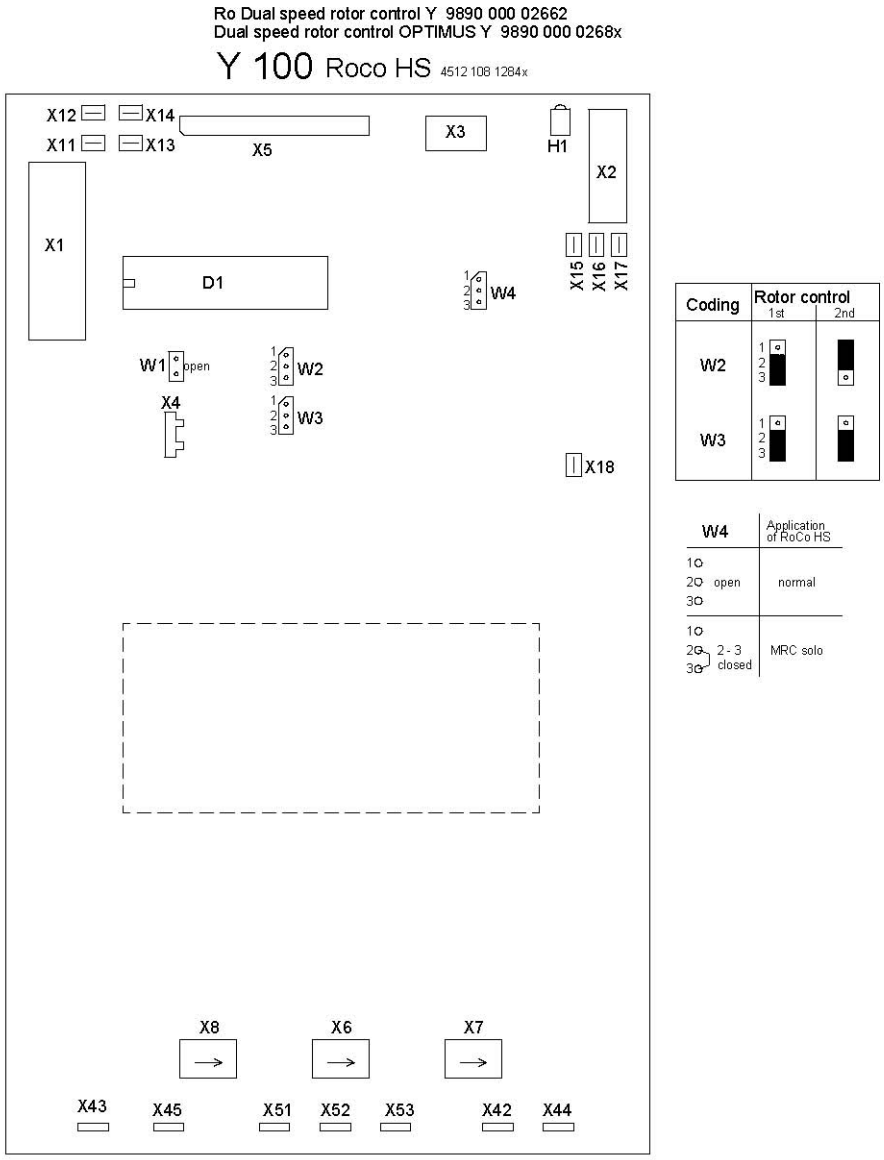
5. ADJUSTMENTS

N / A

6. PROGRAMMING

6.1. HARDWARE

Check jumper settings



D1 = 4512 113 2234x

PCB programming Options

6.2. SOFTWARE

Accurately described in replacement procedure.

7. ACCEPTANCE

N / A

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